
Effect of Smoking and Recent Life Changes Upon Onset of Diseases of the Circulatory System

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THE EFFECT OF THE USE OF CIGARETTES and of recent life changes upon health has received little attention in the literature on life crises and health changes. The research described in this paper was undertaken to examine this relationship in a group of patients hospitalized for diseases of the circulatory system.

Previous Research

Studies of Rahe and associates have indicated that significant increases in life changes act as "stressors" that help to account for the occurrence of myocardial infarctions and coronary deaths (1, 2). In these studies, as in the one described here, a Schedule of Recent Experience (SRE) was used. The SRE is a self-administered questionnaire that allows respondents to document over a given period of their lives the occurrence or absence of 42 various life-event items (marriage, death of a close family member, divorce, changing to a different line of work, change in residence, and so forth). Rahe and Romo, examining recent life changes in relation to the occurrence of myocardial infarction (MI) and coronary deaths in Helsinki, Finland, concluded that (3):

The demonstration of significantly increased recent life changes for both MI survivors and coronary death subjects *during the final six months prior to infarction or death* [italics mine] implies a precipitating influence of these changes upon the onset of illness or death. It would seem to follow that had not these subjects been exposed to significantly increased life demands they might not have developed an infarct or coronary death at the time they did.

In other studies on life crises and health changes, it also has been found that life change units (LCUs) increase significantly during the 6 months before onset of illness (4-6). Rahe states that "six months is the most useful interval to use in constructing LCU totals . . . the bulk of build-up in the life-change intensity was found in the six months prior to illness onset." (4).

The reliability correlations for the SRE questionnaire have ranged from as high as 0.90 to as low as 0.26 because of differences in the intervals between administration of the questionnaire; the 0.90 test-retest correlation was for a 2-week interval and the 0.26 for a 2-year interval (7). Rahe notes that "In my studies of over 600 subjects with coronary heart disease, where subjects' recent life changes are gathered by both interview and questionnaire, the interviewers have been invariably impressed that the information obtained by questionnaire is a valid although conservative estimate of subjects' recent life experience" (7).

In a 1969 study of 394 subjects who scaled 42 life units according to their subjective estimation of the degree of life change and readjustment that would

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be inherent in each of the events, Rahe reported an "impressive degree of agreement on the values assigned" (4). This study also indicated that the subjects' demographic characteristics such as age, race, sex, education, marital status, social class, ethnic origin, and religion did not influence the value or rank ordering of the events (4).

Smoking and Recent Life Changes

In the study by Rahe and Romo (3), MI and coronary subjects who were currently heavy cigarette smokers (more than 1 pack per day) indicated marked recent life-change elevations more frequently than subjects who smoked less. With the exception of this Rahe and Romo study, however, the literature of recent life changes in relation to disease onset does not include use of cigarettes as a variable.

My research was concerned with the relationship of recent life change scores to the level of cigarette use in a group of patients hospitalized for diseases of the circulatory system. Three levels of cigarette use were defined: smoker—a person who regularly smoked at least one cigarette every day; former smoker—a person who had regularly smoked cigarettes but at the time of the interview stated that he or she no longer smoked and had quit before admission to the hospital; and nonsmoker—a person who had never smoked cigarettes or used other tobacco products regularly. Based upon prior research, I assumed that life change units would significantly increase during the 1–6 months before hospitalization as compared with the 7–12 months before. Furthermore, I assumed that smokers would experience a significantly greater increase in LCUs than either former smokers or nonsmokers.

Method

My study sample was part of a larger one being used in a study that focused on quantifying the cigarette-smoking characteristics of patients with many diseases (8). The larger study was limited to adult patients on the medical service who were well enough to participate and agreed to serve as subjects. From these patients, 149 with diagnosed diseases of the circulatory system completed the questionnaire. Comparison of the demographic characteristics of this subsample with those of the larger sample (927 patients) and with the demographic characteristics of all adult medical patients during the time of the investigation revealed no appreciable differences among these groups.

Along with a Schedule of Recent Experience (9),

a questionnaire seeking information on smoking status was given to the 149 patients as soon as possible after their admission to the hospital. Data from the questionnaire indicated that 88.6 percent of the 149 were white and 11.4 percent nonwhite; 44.3 percent were men and 5.7 percent women; 53.7 percent were current smokers of cigarettes, 17.4 percent former smokers of cigarettes, and 38.9 percent nonsmokers.

The patient completed the SRE for two periods: the 1–6 months and the 7–12 months before hospitalization. Division of the year's LCU total into 6-month LCU totals gives an indication as to "whether the subject was building up to a life crisis or whether his life-change intensity was remaining stable, or if he was, in fact, on the downslope of a life crisis" (4). Life change events are scaled from low (relatively unimportant) to high (relatively very important) to afford life change unit (LCU) weights for individual life event items. "The LCU weights indicate the relative degree of life change and readjustment required for each life event as perceived by the average individual" (3).

Results

The mean LCU values for the entire sample of 149 patients for the 1–6 month period before hospitalization were significantly greater than those for the 7–12 month period before: 74.1 (standard deviation 63.6) compared with 56.2 (standard deviation 58.3). The percentage increase was 31.9 ($t = 2.532$; $P < 0.001$). This result is consistent with that found in the studies previously cited.

Contrary to my assumption, the nonsmoker group was the only one that showed a significant increase in LCUs for the 1–6 month period before hospitalization as compared with the 7–12 month period before: $t = 2.520$, $P < 0.01$. Smokers experienced a 20.9 percent increase ($t = 1.338$) and nonsmokers, a 36.3 percent increase ($t = 1.048$).

| Group | Increase in LCUs before hospitalization | |
|---------------------------------|---|--------------------|
| | 1–6 months before | 7–12 months before |
| Smokers ($N = 80$): | | |
| Mean | 81.6 | 67.5 |
| Standard deviation .. | 69.0 | 64.2 |
| Nonsmokers ($N = 43$): | | |
| Mean | 63.6 | 38.7 |
| Standard deviation .. | 50.0 | 41.2 |
| Former smokers ($N = 26$): | | |
| Mean | 68.3 | 50.1 |
| Standard deviation .. | 66.7 | 58.3 |

Pairwise comparisons of the LCU means of the three groups for each of the periods before hospitalization showed the mean for the smokers to be significantly higher than that for the nonsmokers for each period. No differences were found between the LCU means of the former smokers and the nonsmokers for either period.

| Period | Smokers versus nonsmokers | Smokers versus former smokers | Nonsmokers versus former smokers |
|------------------|---------------------------------|--|---|
| 1-6 months . . . | ¹ 1.508 | 0.855 | 0.378 |
| 7-12 months .. | ² 2.656 | 1.228 | 0.945 |

¹ $P < 0.10$ (1-tail). ² $P < 0.01$.

Discussion and Implications

The data in this paper indicate that the patients in this study experienced more life changes in the 1-6 months immediately preceding hospitalization than in the 7-12 months preceding it. These results are consistent with those in a number of studies relating myocardial infarction and life stress (2, 10-13).

However, when the study sample was grouped into smokers, former smokers, and nonsmokers, the pattern was not as homogeneous. Only the nonsmokers showed a significant increase in the LCU mean during the 1-6 month period over the 7-12 month period. Nevertheless, the LCU mean of the smokers was higher than that of the nonsmokers for each period. This result lends further support to the finding of Rahe and Romo that heavy smokers with coronary heart disease showed a marked recent life-change evaluation more frequently than subjects who smoked less (3).

One has to assume that the bias in responses that is inherent in a retrospective study conducted randomly across three categories of cigarette use does not negate the results of my study. The generalizability of these results, however, is limited by the nature of the sample—patients with a variety of diseases of the circulatory system.

The results suggest that the patterns of life change for smokers with diseases of the circulatory system differ from those of nonsmokers with these diseases. Essentially, smokers appear to have a continual buildup of life change during the year preceding onset of the disease, whereas nonsmokers experience a sharp increase in life change 1 to 6 months before onset.

In sum, the results of this investigation suggest

that cigarette use is a variable that should be ascertained and controlled in future studies of life stress and coronary disease onset. Data on cigarette use would supply useful information that might enlarge the psychological and physiological dimensions of the pathway between subjects' exposure to life change and their reports of illness in the near future (7). Furthermore, it is hoped that the relationship of smoking cigarettes and life stress will be taken into account in the treatment of patients with potential circulatory problems.

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